

Section-A(MCQ's)

Q.1 Choose the correct answer for each from the given options:

- (i) In a right angle triangle, the side opposite to right angle is called _____.
 (a) Perpendicular (b) Hypotenuse (c) Altitude (d) Base
- (ii) The point through which bisectors of angles of a triangle pass is called:
 (a) Incentre (b) Orthocenter (c) Centroid (d) None of these
- (iii) $1 + \tan^2 45^\circ = \sec^2$ _____.
 (a) 30° (b) 45° (c) 60° (d) 90°
- (iv) $\sin 30^\circ = \cos$ _____.
 (a) 30° (b) 45° (c) 60° (d) None of these.
- (v) A line which intersects a circle at one and only one point is called _____ to the circle.
 (a) Radial Segment (b) Secant (c) Semi-circle (d) Tangent
- (vi) If a, b and c are in continued proportion, then _____.
 (a) $ab = c^2$ (b) $a^2 = bc$ (c) $ac = b^2$ (d) None these
- (vii) The mean proportion to 75 and 12 are
 (a) ± 20 (b) ± 10 (c) ± 30 (d) ± 40
- (viii) A series contains values 15, 19, 13, 11, 14, 16, its median is:
 (a) 12 (b) 13 (c) 14 (d) 14.5
- (ix) Order of $\begin{bmatrix} \sqrt{3} + 2 \\ 5 + 7 \end{bmatrix}$ is _____.
 (a) 2×2 (b) 1×2 (c) 2×1 (d) None of these
- (x) $(x-6)(x-4) =$ _____.
 (a) $x^2 - 10x - 24$ (b) $x^2 + 10x - 24$ (c) $x^2 - 24x + 24$
 (d) $x^2 - 10x + 24$
- (xi) If $A = \begin{bmatrix} 6 & 4 \\ 3 & 2 \end{bmatrix}$, then $|A| =$ _____.
 (a) 0 (b) 2 (c) 4 (d) 6
- (xii) $ax^2 + bx + c = 0$, will remain quadratic equation, if
 (a) $a \neq 0, b = 0$ and $c = 0$ (b) $a = 0, b \neq 0$, and $c \neq 0$
 (c) $a \neq 0$, and $c = 0$ (d) Both (a) and (c)
- (xiii) If $R = \{(1, 2), (2, 3), (3, 4)\}$, then Range $R =$ _____.
 (a) $\{1, 2, 3\}$ (b) $\{2, 3, 4\}$ (c) $\{1, 2, 3, 4\}$ (d) None of these
- (xiv) If $\log_2 x = 3$, then $x =$ _____.
 (a) 6 (b) 8 (c) 10 (d) 5
- (xv) $\frac{a^m}{a^n} =$ _____.
 (a) a^{m+n} (b) $a^{m \times n}$ (c) a^{m-n} (d) $\frac{m}{a^n}$

- (xvi) The degree of the polynomial $x^2 + xy^2 + y$ is:
 (a) 2 (b) 3 (c) 4 (d) 1
- (xvii) The L.C.M of $x^2 - y^3$ and $x^6 - y^6$ is _____.
 (a) $x^3 - y^3$ (b) $x^3 + y^3$ (c) $x^6 + y^6$ (d) $x^6 - y^6$
- (xviii) If the sum of two angles is 90° then they are called _____.
 (a) Vertical Angles (b) Adjacent Angles (c) Complementary Angles
 (d) Supplementary Angles.
- (xix) If the vertex and one arm of two angles are common, they are called _____.
 (a) Vertical Angles (b) Adjacent Angles (c) Corresponding Angles
 (d) Alternate Angles
- (xx) A quadrilateral having only one pair of opposite sides parallel is called _____.
 (a) Rhombus (b) Trapezoid
 (c) Rectangle (d) Parallelogram

Section-B

Note: Solve any TEN of the following questions. Each question carries 05 marks.

- Q.2 Define Median and give its merits and demerits.
- Q.3 Find the square root of $\left(x + \frac{1}{x}\right)^2 - 4\left(x - \frac{1}{x}\right)$
- Q.4 Prove that: $\frac{1}{1 + \sin \theta} + \frac{1}{1 - \sin \theta} = 2 \sec^2 \theta$
- Q.5 Simplify: $\frac{(27)^{\frac{2n}{3}} \times (8)^{\frac{n}{3}}}{(18)^{\frac{n}{2}}}$
- Q.6 Define any Two of the following and draw the figure.
 Trapezoid Circum circle of a triangle Adjacent Angles
- Q.7 Find the H.C.F of the polynomials by division method:
 $4x^3 - 3x^2 - 24x - 9$ and $8x^3 - 2x^2 - 53x - 39$
- Q.8 If $A = \{a, b\}$, $B = \{2, 3\}$ and $C = \{3, 4\}$ then find $A \times (B - C)$ and $A \times (B \Delta C)$
- Q.9 Prove that: $\log_b m = \log_a m \cdot \log_b a$
- Q.10 Find the value of $x^3 + y^3$ when $x + y = -5$ and $xy = 8$.
- Q.11 Two numbers are in the ratio 7:8 and their sum is 105. Find the numbers.
- Q.12 Solve the equations by using Cramer's rule. $2x + 5y = 9$, $4x - 2y = 1$
- Q.13 Prove that, if a perpendicular is drawn from the centre of a circle to a chord, it bisects the chord.

Q.14 Eliminate x from the equations: $x + \frac{1}{x} = 2p$, $x - \frac{1}{x} = 2q + 1$

Q.15 Solve the equation by completing square: $2x^2 + 10x - 48 = 0$

Section-C

Note: Solve the THREE of the following questions. Each question carries 10 marks.

- Q.16 (a) Simplify: $\frac{x+2y}{x^2-xy} + \frac{x^2+4xy+3y^2}{x(x^2-y^2)}$
 (b) Solve the equation $5x^2 + 11x = 4(3x + 1)$ with the help of quadratic formula.
- Q.17 (a) Prove that, if a side of a triangle is extended, the exterior angle so formed is, in measure, greater than either of the two interior opposite angles.
 (b) Find the factor of $x^3 - x^2 - 14x + 24$ with the help of remainder theorem.
- Q.18 (a) Find all the values of trigonometric ratio of 45° .
 (b) Find the value of $\frac{\sqrt{4315 \times (12)^2}}{\sqrt[3]{36.98}}$ with the help of logarithm.
- Q.19 (a) On the bank of a sea, there is a light house, 100m high. The angle of depression of a ship from the top of the light house is of 45° . Find the distance between the foot of the light house and the ship.
 (b) If $A = \begin{bmatrix} 3 & 2 \\ 5 & 4 \end{bmatrix}$, then find A^{-1} .
- Q.20 Construct a triangle ABC in which $m\angle A = 50^\circ$, $m\angle B = 105^\circ$ and $m\overline{BC} = 4$ cm. Draw its escribed circle opposite to the $\angle A$.